EMPIRICAL ANALYSIS OF FOREIGN EXCHANGE RATE AND STOCK PRICE INDICES: EVIDENCE FROM EMERGING COUNTRIES

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ABSTRACT

The main aim behind this research is to find out the exchange rate risk on stock price indices return volatility of 22 emerging countries. The study is based on the monthly stock index and foreign exchange rate in relation the USD of the related 22 countries' data between January 2000 and December 2016. Both fixed effect and random effect models were tested. The fixed effect model assumes that stocks are correlated with country specific exchange rates while the random effect model assumes residuals are uncorrelated with the country specific exchange rates. Furthermore, country specific variance on stock index return was tested using the Breusch and Pagan LR test, and it was found that there is no country specific volatility, which means that their variance is zero. This means that there are not any country specific effects in the model, which can be interpreted to mean that there is no medium or long-term arbitrage possibilities with international transactions. Finally, it was observed that exchange rate changes had a negative impact on stock index returns. The previous month's stock market movement or random term did not have any impact on the current market returns according to AR and MA terms. Moreover, international foreign exchange market and stock market cooperate consistently, uncausing any arbitrage possibility on monthly basis. Daily models might detect short-term arbitrage failures in international transactions. Furthermore, there are asymmetric GARCH models to test the gain and loss volatility on transactions.

Keywords: Exchange Rates, Stock Price Indexes, Emerging Markets, GARCH Model

JEL Codes: F31, G15, G10, B23

ÖZET

Döviz kurlarının hisse senedi piyasalarındaki oynaklığa etkisini araştıran bu çalışma, Ocak 2000 - Aralık 2016 yılları arasında 22 ülkenin para birimlerinin ABD Dolarına karşı değerleri ve hisse senedi endekslerinin aylık verileri kullanılarak sabit ve rasgele etki modellerinin test edilmesiyle gerçekleştirilmiştir. Sabit etki modeli endeksler ile döviz kurları arasında bir korelasyon olduğunu gösterirken rasgele etki modeline göre herhangi bir korelasyon bulunamamıştır. Breusch ve Pagan LR testi kullanılarak ülkelere özgü hisse senedi getirilerinin varyansları hesaplanmış ve ülkelere özgü oynaklık riski bulunamamış olup, hisse senedi endeksleri ve döviz kuru arasındaki varyans sıfırdır. Buna ek olarak rasgele etki modeli hisse senedi endeks getirileri ve döviz kurları arasındaki ilişkiyi açıklamak için uygundur. Bu uygunluk, modelde herhangi bir ülkeye özgü etki olmadığından dolayı orta ve uzun vadede uluslararası işlemlerde herhangi bir arbitraj fırsatı olmadığı anlamında yorumlanabilir. Son olarak döviz kurundaki değişimin endeksler üzerinde negatif bir etkisi olduğu gözlenmiştir. Yapılan AR ve MA terimlerine göre geçmiş ay endeks getirilerinin endeks getirileri üzerinde herhangi bir etkiye sahip olmadıkları anlaşılmıştır. Bütün bunlara ek olarak günlük modellerde kısa süreli arbitraj imkânı bulunsa da uluslararası döviz piyasaları ve hisse senedi piyasaları aylık bazda herhangi bir arbitraj fırsatına olanak sağlamayacak şekilde birlikte hareket etmektedir.

Anahtar Kelimeler: Döviz Kurları, Hisse Senedi Endeksleri, Gelişmekte Olan Ülkeler, GARCH Model

JEL Kodları: F31, G15, G10, B23

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1.INTRODUCTION

Volatility has been defined as asset price changes and is an important parameter used by investors for their portfolios. The key factor is to measure the volatility as correctly as possible. Having accepted this as a starting point we will move on to volatility analysis between exchange rates and stock price index. Liberalization can be seen most accurately in the equity market worldwide. Hence, it becomes quite easy to monitor capital movements on exchange rates and stock prices. In order to prevent overheating in economies, interest rate increments and balance sheet reductions occur and as a result the foreign exchange goes up.

In time, an increase in stock prices creates wealth growth, money demand and an increase in interest rates. High interest rates trigger the flow of foreign capital into the country and the national currency appreciates. On one hand this appreciation is bad news for firms that are exporting to other countries while on the other, inputs related to export become cheaper, national production firms benefit from this and their stock values increase.

There is a heavy capital flow to emerging markets due to the low interest rate policy in USA and the low value of US dollar compared other currencies. Our main goal with this research is related to whether investors from emerging markets could transform these changes into their investments or not?

2.LITERATURE SURVEY

In the literature of finance, there are two main theories that explain the relationship between stock indices and foreign exchange. The first is a traditional approach trying to explain effects of volatility on the exchange rate of firms' stock of firms. Dornbusch and Fisher (1980) indicated that there is a positive relation between stock price increment and exchange rates. The second approach, named the Portfolio Balance Approach, asserts that there is a negative relationship between stock prices and exchange rate (Branson, 1983). In this model, stock prices are seen as causes of exchange rates. According to the traditional approach, a change in exchange rates affects the profitability of firms' stock prices. However, in the portfolio balance approach, an increase in stock price leads to a decrease in exchange rate and thus creating a negative relationship.

The literature was divided into two main groups. In the first group we reviewed studies that investigate the link between the two variables in developing countries. Research conducted on emerging markets, studies that measure stock prices and exchange rate effects are summarized below.

Kıymaz (2003) examined 109 firms from Istanbul Stock Exchange between the dates 1991 to 1998. The results of the study indicated that Turkish firms were under high exchange rate risk. Chue&Cook(2008) investigated the effects of exchange rate changes on stock price indices in emerging markets and found that between the years 1999 and 2002, many of emerging markets were affected negatively by exchange rate changes. However, between the years 2002 and 2006 these negative effects were not observed. Kho & Stultz (2000) conducted in five East Asian countries and they analyzed effects of exchange rate change on the banking sector. It was found that only Indonesia and The Philippines had negative exchange rate effects on stock price indices. During the 1980-1999 period, the research on industrial companies including eight developing markets Dominguez&Tesar (2006) found that the effect of exchange rate changes on firms' appearances was related to factors such as firm size, internationalized export level and competitiveness. Erbaykal&Okuyan's study (2007) includes 13 emerging markets' stock indices and exchange rates. The relationship between two variables was investigated via both the traditional and the portfolio balance approach. In this study, it was shown that having an efficient stock market in emerging countries contributes to building a stable exchange rate policy. Similar to this, Altunöz (2016) studied 10 emerging countries' stock prices & exchange rates. Then co-integration relations and causality tests were conducted in the case of there being a dependent variable either stock exchange or exchange rate. Symth&Narayan,(2011) used Granger Causality test in eight Asian countries to test the relationship between exchange rate and stock prices and found that these two variables were affected by each other. Symth &Nandha (2013) studied data for the six-year period between 1995 and 2001 and they observed linkages between exchange rates and stock prices in Bangladesh, India, Pakistan and Sri Lanka. As a result of both the Angle-Granger and Johansen method being used, a link between the two variables could not be detected in the long term, which is valid for all four countries. Akdogu & Birkan(2016) conducted causality tests to determine the direction of the relationship between stock index and exchange rates in 21 developing country markets during the period covering the years 2003-2013. A statistically significant causality relation was found in 13 out of 21 countries as a result of the analysis done with the monthly selected data set. A similar study was conducted by Rahman and Udin (2009) in three South Asian countries using the monthly data set for the period of 2003-2008, based on value of the US Dollar against Bangladesh's currency Taka, Indian Rupee and Pakistan Rupee and stock exchange market of the countries. According to the empirical findings, there is no link between foreign exchange rates and stock market data. Moreover, no relationship was

found in the applied Granger Causality analysis. In other research conducted during 1994-2009 four emerging markets' stock prices and foreign exchange volatility, were analyzed using GARCH Model by Walid, Chaker, Masood & Fry (2011). The results showed that foreign exchange and stock prices are directly dependent on government policy and stock price fluctuation were found to be responsive to changes in international foreign exchange markets. Parsva&Lean (2011) did research to observe the relation between stock returns and foreign exchange in six countries which are Egypt, Iran, Jordan, Kuwait, Oman and Saudi Arabia. Empirical findings found that there is a causality relationship between the two variables both for long and short terms in Egypt, Iran and Oman. No short run connection was found between Jordan and Saudi Arabia. However, in Kuwait it was found that there is a causality relationship from foreign exchange to stock price. In addition, interaction between markets was shown to increase during periods of financial crises.

In the second group, we reviewed studies that investigate the link between exchange rates and stock prices in developed countries. We also examine some studies that use data sets both from developed and developing countries grouped below.

In this study, Zhao (2010) found that it was not possible to establish a long lasting relationship between the stock and the exchange rate denominated in the 1991-2009 period using the VAR and GARCH models in China including 222 observation data set. In another study conducted by Tsagkanos & Siriopoulos (2013), they compare the findings in European Union Countries, USA stock prices and exchange rates during the financial crisis of 2008-2012 with under normal conditions.In the research that took place in Australia, the connection between stock prices and foreign exchange was analyzed by Richards & Simpson (2009). During the whole research period, the stocks valued at 2/3, while the Australian dollar was valued at 1/3. According to the Granger test, the relationship between stock price and foreign exchange was found to be positive. Other research conducted between January 2002 and December 2014 was done by Zivkov, Njegic & Mirovic (2016) to determine the relationship between four Eastern Europe countries' stock indices and their currencies. Stock indexes from Warsaw Prague Budapest and Moskow exchange with their respective currencies Zloty, Koruna, Forint and Ruble were analyzed in relation to the US Dollar. For all the countries stated, the findings were found to be compatible to the portfolio balance theory. Different research has been done by Antell&Vaihekoski (2012) to prove international investors should focus on national risk. The data used for this was obtained from USA, Finland and Sweden stock markets between March 1970 and August 2009. National risk was priced in Finland and Sweden markets, however not priced in USA. The research done by Nieha&Lee (2001) involving G-7 countries, (Canada, France, Germany, Italy, Japan, England and USA) analyzed the 618 observations stock indexes and foreign exchange daily closing prices from 1993 to 1996. The findings from the time series analysis indicated that in the G-7 countries, there was no relationship between the two variables in the long term. There are also studies combining developed and emerging markets data. According to the study of Ülkü & Demirci (2012), the return of developed and emerging markets is related to the connection between stock indexes and the value of the local currency. The connection between currency value and stock exchange is heavily dependent on foreign capital and the depth of the local exchange. Another study by Ming, Fok & Liu (2007) was carried out in East Asian countries between 1988-1998. The relationship between foreign exchange and stock prices was analyzed in these countries; Hong Kong, Japan, Malesia and Thailand, there was a causality relationship between stock prices to foreign exchange before the 1997 financial crises. On the contrary, in Hong Kong, Korea and Singapore the opposite was true meaning there is a causality relationship between stock markets and foreign exchange. During the period of the Asian financial crises, none of the countries indicated any causality relationship from stock prices to foreign exchange. However, a causality relationship between foreign exchange and stock prices was found in every country except Malaysia.Based on monthly time series data from 24 countries and non-linear ARDL method, Bahmani&Saha (2017) showed that the effects of exchange rate fluctuations on stock prices could be asymmetric. Harjito&McGowan (2011) used the Granger Causality and Johansen Cointegration Test. The statistical relations between stock prices and foreign exchange was researched in Indonesia, Philippines, Singapore and Thailand between 1993 and 2002. In the research, the relation between stock prices and foreign exchange was found to be dependent on a feedback system and both variables in the four countries were found to be connected. Causality relationship occurs from foreign exchange to stock prices. In another survey conducted by Wong (2017) developed and developing countries were taken as datasets and links between foreign currency denominations were tested. In general exchange markets had a repressive effect on the stock market.

3.DATA AND METHODOLOGY

The study based on the monthly stock index and foreign exchange rate on USD of the related 22 countries' data between January 2000 and December 2016. The first month data was missed as the returns were calculated and the data consisted 184 time points with missing values making a total of 4407 valid observations. Returns have been calculated as suggested by Urquhart & McGroarty (2014).

$$err_{i,t} = \ln\left(\frac{ER_{i,t}}{ER_{i,t-1}}\right) \quad , ser_{i,t} = \ln(\frac{SE_{i,t}}{SE_{i,t-1}}) \tag{1}$$

Where $err_{i,t}$ is the natural logarithm of the exchange rate of the i'th country at time point t, and $ser_{i,t}$ is stock market return at the related month.

Figure 1: Exchange Rate Returns of 22 Countries

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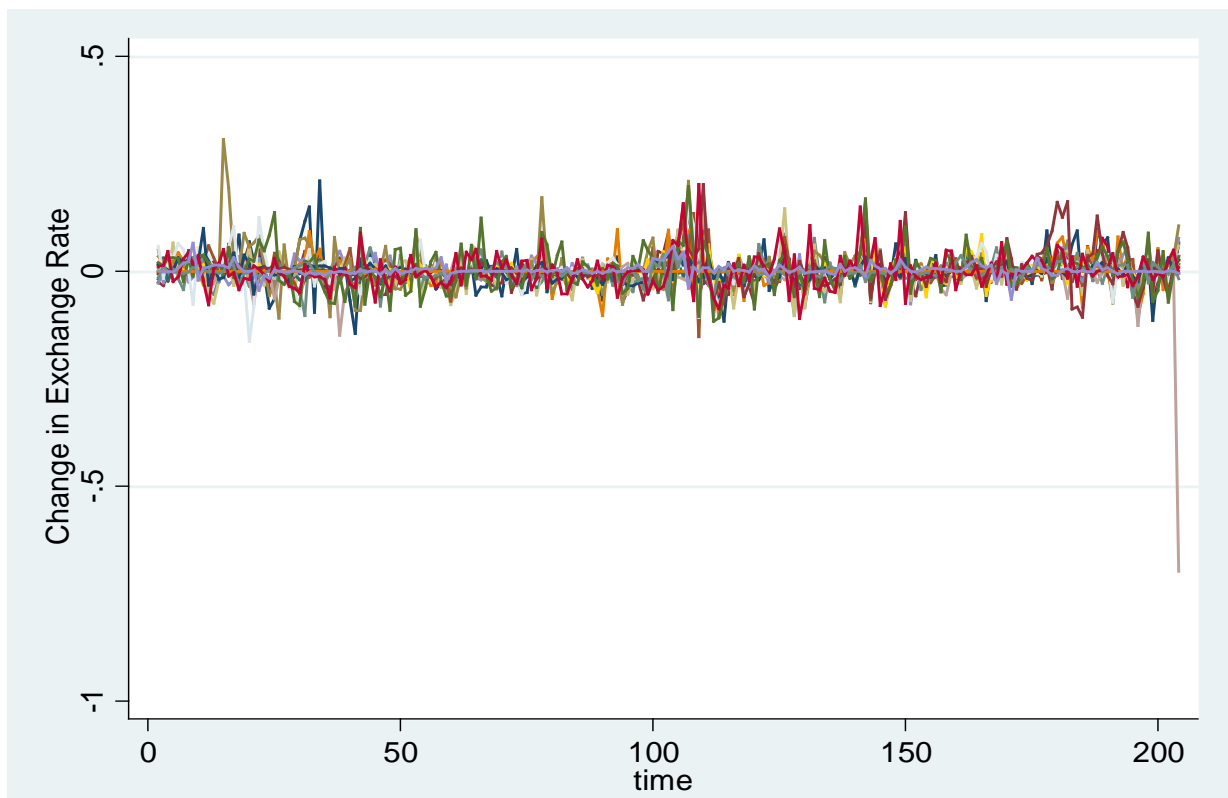
Figure 2: Stock Indices Returns
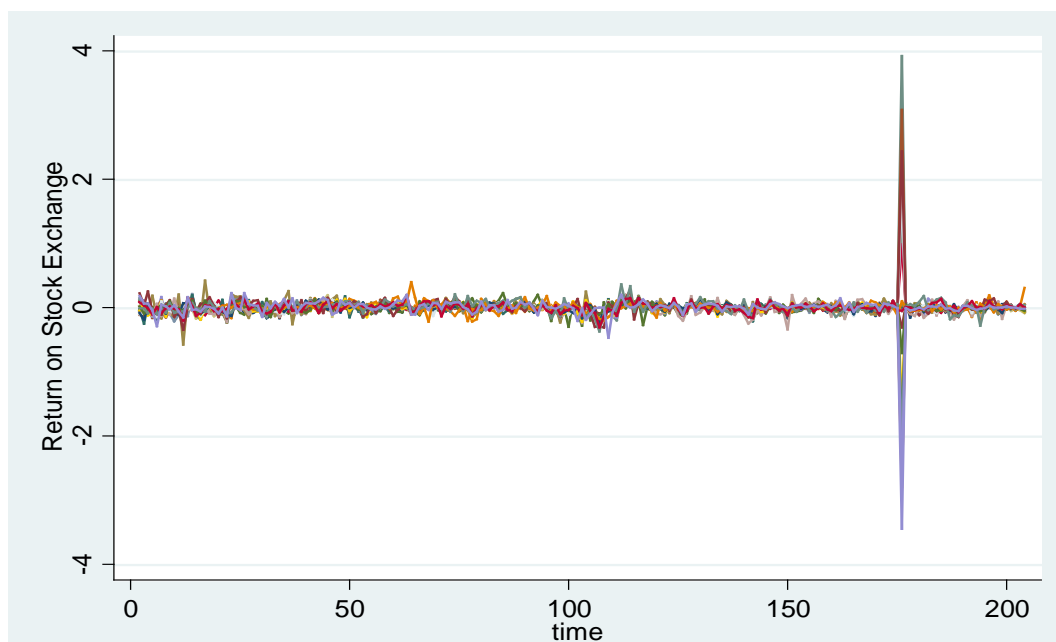
The graphs present the stock index returns and changes in currency exchange rates to the USD for each panel (countries). Time series analysis requests that the variables should be stationary through the investigated time period. Unit root test are used to determine the stationarity or the process to capture the stationarity. The panel data unit root test often requires strongly balanced data that means each panel should be observed at the same time point with equal intervals. The missing values in the data of this study caused to use Im-Pesaran-trend was not included at the process according to the graphical representations above. Several lag values have been selected to determine the optimal lag level. The panel means have been included in the estimation as suggested (Levin et.al, 2002). Another test is the Fisher type unit root test. This test was conducted with 1 lag and 12 lags due of monthly data used for estimation. The modified inverse chi-square Pm test statistic was interpreted among others.

Table 1: Unit Root Tests for Stock Index and Exchange Rate Returns

Variable:	Exchange Rate Change		ADF Lag Est.	Stock Exchange Return		ADF Lag Est.
Lags	Statistic	p-value		Statistic	p-value	
1	-58.3338	0.000	0.18	-65.4787	0.000	0.05
2,3,4,6	-55.5153	0.000	0.23	-65.4787	0.000	0.05
9,12	-54.3126	0.000	0.55	-65.4787	0.000	0.05
Lags	Fisher Unit Root test			Fisher Unit Root test		
1	145.4943	0.000		158.2853	0.000	
12	26.7428	0.000		24.3810	0.000	

ADF lag estimations have been estimated same depending on BIC, AIC and HQIC information criteria. Accordingly the latter models would be estimated with one lagged exogenous variables.

$$AIC = \ln\left(|\Sigma|\right) + \frac{2pM^2}{T}$$

$$SBIC = \ln\left(|\Sigma|\right) + \frac{\ln(T)}{T}pM^2$$

$$HQIC = \ln\left(|\Sigma|\right) + \frac{2\ln\left[\ln(T)\right]}{T}pM^2 \tag{2}$$

The effect model of exchange rate on stock index might consist country specific mean effects or time variant random errors. The Hausman test was used to determine whether a fixed effect model or a random effect model fit this relation.

Table 2: Fixed Effect Model of Exchange Rate Return on Stock Index Return

```
Fixed-effects (within) regression          Number of obs      =       4407
Group variable: ccode                      Number of groups   =         22

R-sq:  within  = 0.0197                     Obs per group: min =        184
       between = 0.0449                                     avg =      200.3
       overall = 0.0192                                     max =        203

                                            F(1, 4384)         =      88.12
corr(u_i, Xb)   = -0.0368                   Prob > F           =     0.0000
```

ser	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
err	-.6476959	.068999	-9.39	0.000	-.7829689	-.512423
_cons	.0070598	.0022919	3.08	0.002	.0025666	.011553
sigma_u	.00965565					
sigma_e	.15203081					
rho	.00401746	(fraction of variance due to u_i)				

```
F test that all u_i=0:      F(21, 4384) =      0.80              Prob > F = 0.7267
```

Fixed effect model assumes that shocks are correlated with country specific exchange rates which is -0.0368. The mean logarithmic stock exchange return is 0.0070 and with %1 increase of USD exchange rate, the value decreases approximately 0.648. The model is statistical significant although the determination coefficient low as 1.92%.

Table 3: Random Effect Model of Exchange Rate Return on Stock Index Return

```
Random-effects GLS regression              Number of obs     =        4407
Group variable: ccode                      Number of groups  =          22

R-sq:   within  = 0.0197                    Obs per group: min =         184
        between = 0.0449                                   avg =       200.3
        overall = 0.0192                                   max =         203

                                           Wald chi2(1)       =       86.14
corr(u_i, X)    = 0 (assumed)              Prob > chi2        =      0.0000
```

ser	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
err	-.6373517	.0686717	-9.28	0.000	-.7719457	-.5027576
_cons	.0070465	.0022907	3.08	0.002	.0025568	.0115363
sigma_u	0					
sigma_e	.15203081					
rho	0	(fraction of variance due to u_i)				

Random effect model assumes that residuals are uncorrelated with the country specific exchange rates. The explained coefficients are similar but not the exact same. The Hausman specification test was conducted using these two equations.

Table 4: Hausman Test Result

	(b) eqfe	(B) eqre	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
err	-.6476959	-.6373517	-.0103443	.0067129

```
                 b = consistent under Ho and Ha; obtained from xtreg
         B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

           chi2(1) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                   =         2.37
           Prob>chi2 =       0.1233
```

Furthermore, country specific variance on stock index return was tested with Breusch and Pagan LR test, which explained that there is not country specific volatility. It means their variance is zero.

Table 5: Breusch & Pagan LM Test

```
Breusch and Pagan Lagrangian multiplier test for random effects

        ser[ccode,t] = Xb + u[ccode] + e[ccode,t]

        Estimated results:
                              Var        sd = sqrt(Var)
                     _____
                 ser |     .0235372         .1534184
                   e |     .0231134         .1520308
                   u |            0                0

   Test:    Var(u) = 0
                            chibar2(01) =        0.00
                          Prob > chibar2 =     1.0000
```

The random error model fit the relation between the stock index return and USD exchange rates. That means there is no country specific effects in the model, which might be interpreted as there is no medium or long term arbitrage possibilities with international transactions.

The ARCH models have been used to investigate the effects of financial volatility in literature (Engle, 1982; Hayo and Kutan, 2005; Wu and Shea 2011) often used with high-frequency data. The ARCH models were designed to capture empirically the periods of large and volatile movements, followed by normal periods, which were generated either endogenously or exogenously. The relationship of stock market anomalies with the time effects and with the herding effect would ideally be tested over relative long time period with low frequency (Beaumont et al., 2008). The predictive power of a simple and most robust GARCH (1,1) model challenges others and also often used model, when there were effects on the data and related to some additional affecting exploratory variables in modeling (Engle, 2001; Lunde and Hansen, 2005); it also dominates other models and other (p,q) values. Furthermore, GARCH (p,q) models allows to model the variance as conditional on the past variance and error, instead of holding it fixed through the series (Engel and Rangel, 2008; Urquhart and McGroarty, 2014). Larger volatilities had to be expected in emerging markets or in the low growth economies, which called a dampening effect on volatility in the presence of robust economic growth. It moderates the swinging the asset prices wildly and the need to gather together the expectations of traders' response to the next news. So, some combination of present and past movement accounted for the time-varying nature of stock returns.

The priming variance values have been specified by the error terms of the expected unconditional variance of the model from the mean equation and any ARMA terms.

$$\sigma_{i,t,0}^2 = \frac{\sum_{t=1}^{T} \hat{\varepsilon}_{i,t}^2}{T}$$

(3)

The standard errors have been optimized by OPG optimization technique. Any constraints were assumed by the estimation process, but the stationary would be achieved, when the sum of α1+α2<1 restriction is satisfied.

$$ser_{i,t} = \beta_0 + \beta_1 err_{i,t} + \phi ser_{i,t-1} + \theta \varepsilon_{i,t-1} + \varepsilon_{i,t}$$

$$Var(\varepsilon_{i,t}) = \sigma_t^2 = \alpha_0 + \alpha_1 \varepsilon_{i,t*1}^2 + \alpha_2 \sigma_{t-1}^2$$

(4)

The Wald test results support the persistence of the conditional volatility models. The parameter estimations and model fit and significance statistics have been presented in the following Table.

Table 6: GARCH Model Estimation

```
Sample: 2 - 204, but with gaps              Number of obs   =      4407
Distribution: Gaussian                      Wald chi2(3)    =    216.92
Log likelihood =  2470.156                  Prob > chi2     =    0.0000
```

ser	OPG Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
ser						
err	-.6640865	.0462736	-14.35	0.000	-.7547811	-.5733919
_cons	.006616	.0027824	2.38	0.017	.0011626	.0120695
ARMA						
ar						
L1.	.7703456	1.174248	0.66	0.512	-1.531137	3.071829
ma						
L1.	-.764725	1.186819	-0.64	0.519	-3.090848	1.561398
ARCH						
arch						
L1.	-.002571	.0000255	-100.99	0.000	-.0026209	-.0025212
garch						
L1.	1.018459	.0001342	7588.76	0.000	1.018196	1.018723
_cons	-.0003905	3.48e-06	-112.13	0.000	-.0003974	-.0003837

The exchange rate increases had a negative impact on stock index returns. There was a monthly mean market return of 0.66%. The previous month's stock market movement or random term had no impact on current market return according to ARMA terms, which were statistically insignificant. However, the squared previous month shock ARCH term and previous long term volatility GARCH term (variance) had a significant effect on volatility. As short term errors decrease the volatility, the long term effect multiplies it by approximately 1.02 that means high volatility causes 0.2% increase on next month's volatility.

4.CONCLUSION

The main goal of this research is to clear any significant relationship between the exchange rates and stock indexes of 22 specific countries' emerging markets. Based on data from the period of January 2000 and December 2016, the study focuses on the monthly stock index and foreign exchange rates of the countries in relation to the US dollar. It is found that there is no country specific volatility. The reason for this is economic globalization. In addition to that, exchange rate changes had a negative impact on stock index returns. Furthermore, it has been also found that the international foreign exchange market and stock market work cooperatively good and transactions prohibit arbitrage in medium or long term periods on a monthly basis. For a study to be conducted in the future, daily models might detect short term arbitrage failures in international transactions. Furthermore, there are asymmetric GARCH models can be used to test the gain and loss volatility on transactions.

References

Akdogu, S. K. & Birkan, A. O., 2016. Interaction between Stock Prices and Exchange Rate in Emerging Market Economies. Research in World Economy, 7(1), pp. 80-94.

Altunöz, U., 2016. Döviz Kuru İle Hisse Senedi Fiyatlari Arasindaki İlişkinin Ampirik Analizi: Gelişen Ülkeler Örneği. International Journal of Management Economics and Business, 16(Special Issue), pp. 663-671.

Antell, J. & Vaihekoski, M., 2012. Pricing Currency Risk in the Stock Market: Evidence from Finland and Sweden 1970–2009. Journal of International Financial Markets, Institutions & Money, Issue 22, pp. 120-136.

Bahmani-Oskooee, M. & Saha, S., 2017. On the Relation between Exchange Rates and Stock Prices: a Non-Linear ARDL Approach and Asymmetry Analysis. Journal of Economics and Finance, pp. 1-26.

Beaumont, P. M., Norrbin, S. C. and Yiğit, F. P. 2008. Time Series Evidence on the Linkage between the Volatility and Growth of Output. Applied Economic Letters, 15, pp. 45-48.

Branson,W.H.,1983.A Model of Exchange-Rate Determination with Policy Reaction: Evidence from Monthly Data. NBER Working Paper 1135,pp.2-35.

Chue, T. K. & Cook, D., 2008. Emerging Market Exchange Rate Exposure. Journal of Banking & Finance, 32(7), pp.1349–1362.

Dominguez, K. M. & Tesar, L. L., 2006. Exchange Rate Exposure. Journal of International Economics, 68(1), pp.188– 218.

Dornbush, R. & Fisher, S., 1980. Exchange Rates and Current Account. American Economic Review, 70(5), pp. 960-971.

Engle, R. F. 1982. Autoregressive Conditional Heteroskedasticity with Estimates of the Variance of U.K. Inflation. Econometrica, 50(4), pp.987-1008.

Engle, R. F. 2001. GARCH 101: The Use of ARCH/GARCH Models in Applied Econometrics. Journal of Economic Perspectives, 15(4), pp. 157-168.

Engle, R. F. and Rangel, J. G. 2008. The Spline-GARCH Model for Low-Frequency Volatility and Its Global Macroeconomic Causes. Review of Financial Studies, 21(3), pp. 1187-1222.

Erbaykal, E.& Okuyan, H.A.,2007. Hisse Senedi Fiyatları ile Döviz Kuru İlişkisi: Gelişmekte Olan Ülkeler Üzerine Ampirik Bir Uygulama. BDDK Bankacılık ve Finansal Piyasalar Dergisi , 1(1), pp.77-89.

Hayo, B. and Kutan, A. M. 2005. IMF-Related News and Emerging Financial Markets, Journal of International Money and Finance, 24, pp. 1126-1142.

Harjito,D.A.& McGowan, C.B., 2011. Stock Price and Exchange Rate Causality: The Case of Four Asian Countries. Southwestern Economic Review, pp.103-114.

Im, K. S., M. H. Pesaran, and Y. Shin. 2003. Testing for Unit Roots in Heterogeneous Panels. Journal of Econometrics, 115,pp. 53-74.

Kho, B.-C. & Stulz, R. M., 2000. Banks, the IMF, and the Asian Crisis. Pacific-Basin Finance Journal ,8, pp. 177–216.

Kiymaz, H., 2003. Estimation of Foreign Exchange Exposure: an Emerging Market Application. Journal of Multinational Financial Management, 13(1), pp. 71-84.

Lean, H. H., Narayan, P. K. K. & Smyth, R., 2011. Exchange Rate and Stock Price Interaction in Major Asian Markets: Evidence for Individual Countries and Panels Allowing for Structural Breaks. Singapore Economic Review, 56(2), pp. 255-277.

Levin, A., C.-F. Lin, and C.-S. J. Chu. 2002. Unit Root Tests in Panel Data: Asymptotic and Finite-Sample Properties. Journal of Econometrics, 108, pp.1-24.

Lunde, A. and Hansen, P. R. 2005. A forecast comparison of volatility models: does anything beat a GARCH (1,1)?. Journal of Applied Econometrics, 20(7), pp. 873-889.

Ming, S.P., Fok, R. and Liu A.Y., 2007. Dynamic Linkages between Exchange Rates and Stock Prices: Evidence from East Asian Markets. International Review of Economics & Finance, 16(4), pp.503-520.

Nieha&Lee., 2001. Dynamic Relationship between Stock Prices and Exchange Rates for G-7 Countries, The Quarterly Review of Economics and Finance, 41,pp.477-490.

Parsva, P. & Lean, H. H., 2011. The Analysis of Relationship between Stock Prices and Exchange Rates: Evidence from Six Middle Eastern Financial Markets. International Research Journal of Finance and Economics, Issue 66, pp. 157-171.

Rahman,L.&Uddin,J.,2009. Dynamic Relationship between Stock Prices and Exchange Rates: Evidence from Three South Asian Countries. International Business Research , 2(2), pp. 167-174.

Rene´, M. S. & Kho, B.-C., 2000. Banks, the IMF, and the Asian Crisis. Pacific-Basin Finance Journal, 8(1), pp. 177–216.

Richards, N. D. & Simpson, J., 2009. The Interaction between Exchange Rates and Stock Prices: An Australian Context. International Journal of Economics and Finance, 1(1), pp. 3-23.

Smyth, R. & Nandha, M., 2003. Bivariate Causality Between Exchange Rates and Stock Prices in South Asia. Applied Economics Letters, 10(11), pp. 699-704.

Tsagkanos, A. & Siriopoulos, C., 2013. A Long-Run Relationship Between Stock Price Index and Exchange Rate: A Structural Nonparametric Cointegrating Regression Approach. Journal of International Financial Markets, Institutions & Money, 25, pp. 106-118.

Urquhart, A.&McGroarty, F. 2014. Calendar Effects, Market Conditions and Adaptive Market Hypothesis: Evidence from Long-Run U.S. Data. International Review of Financial Analysis, 35, pp. 154-166.

Ülkü, N. & Demirci, E., 2012. Joint Dynamics of Foreign Exchange and Stock Markets in Emerging Europe. Journal of International Financial Markets, Institutions & Money, Issue 22, pp. 55-86.

Walid, C., Chaker, A., Masood, O. & Fry, J., 2011. Stock Market Volatility and Exchange Rates in Emerging Countries: A Markov-State Switching Approach. Emerging Markets Review, Issue 12, pp. 272-292.

Wong,H.T., 2017. Real Exchange Rate Returns and Real Stock Price Returns. International Review of Economics and Finance, Volume 49, pp. 340-352.

Wu, H. X. and Shea, E. Y. P. 2011. Explaining the China Puzzle: High Growth and Low Volatility in the Absence of Healthy Financial Institutions, EcoMod2011 Conference, Azores, Portugal, June 29-July 1.

Zhao, H., 2010. Dynamic Relationship Between Exchange Rate and Stock Price: Evidence from China. Research in International Business and Finance, 24(2), pp. 103–112.

Živkov, D., Njegić, J. & Mirović, V., 2016. Dynamic Nexus between Exchange Rate and Stock Prices in The Major East European Economies. Prague Economic Papers, 25(6), pp. 686- 705.